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EXAMINER

AMINI, JAVID A

ART UNIT PAPER NUMBER

2672

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/584,604

Applicant(s)

ROSENBERG, SCOTT A.

Examiner

Javid A. Amini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) _____ is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 26-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

This office action is in response to pre-brief appeal conference decision on 11/04/2005.

Examiner's comment: after reopening prosecution and reexamining the claim inventions, Applicant requires explicitly specify the ambiguity of the following issues, The following rejections applied to the claim invention:

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 26-54 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant claims that transferring pixel data at a given memory address range using transformation engine and without using a fetch engine. But applicant does not specify, and it is not clear what type of algorithms or methods applicant uses. The following quotes are copied and pasted from the specification: from page 2, (when multiple transformations are needed, the programmer must awkwardly impose the transformations by causing the fetch engine to manipulate the data between a memory location and the various transformation engines.) and from page 3, (the pixel data may be operated on by a plurality of transformation engines such as the scaling engine 100, the color conversion engine 106, and the composition engine 104. To do

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so, a fetch engine (not shown) fetches the data from memory and passes it to a first transformation engine.). Examiner's comments: the specification does not support the claim language that Applicant uses.

Applicant in claims 36-37 and 48-49 claims a "second transformation" was not described in the specification.

Examiner's questions:

Does Applicant locate and load any pixel data (computer instructions)?

What type of transfer function is Applicant claiming (the Laplace or Fourier transform)?

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 34, 35, 48-54 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant uses the term "TRANSFER FUNCTION" to specify the mapping, writing, reading, performing, and etc. of the addresses of pixel data. The transfer function in general terms can be written as a program or can be used as hardware. The definition of the transfer function: 1. A mathematical statement that describes the transfer characteristics of a system, subsystem, or equipment. 2. The relationship between the input and the output of a system, subsystem, or equipment in terms of the transfer characteristics. Therefore in respect to the definition the fetch engine is considered also as a transfer function.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 26-54 rejected under 35 U.S.C. 103(a) as being unpatentable over Homan Igehy et al. (hereinafter referred as a Homan), R. Pendse and further in view of R. Bhagavathula (hereinafter referred as a Pendse).

1. Claims 26-28.

A method comprising: transferring pixel data to a transformation engine at a given memory address range; performing a transformation on the pixel data; and readdressing the transformed pixel data to another memory address range without using a fetch engine. Homan page 133 under subject of “mip mapping” teaches a transformation for each pixel data. Homan in fig. 3 illustrates readdressing the transformed pixel data to another address range using the transformation engine and. Examiner’s comment: As claim language on page 2 last line of claim 26 claims “without using a fetch engine” and the reference Homan combines prefetching and caching, which are not considered as a “fetch engine”. Applicant requires to provide an explicit definition for “a fetch engine”, to support the specification see fig. 2. Examiner’s Questions: where in fig. 2 illustrates “without using a fetch engine”? How the data in fig. 2 controlled between memory 102, scaling 100, color 106 and composition 104? By referring to the specification on pages 2 and 3, lines 12-16, 14-19, respectively, regarding the terminology of

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“transformation engines”. The following quotes are copied and pasted from the specification: from page 2, (when multiple transformations are needed, the programmer must awkwardly impose the transformations by causing the fetch engine to manipulate the data between a memory location and the various transformation engines.), Examiner’s comment: The specification discloses that the claim invention is using a fetch engine. Applicant needs to clear the statement in the specification and the claim language. On page 3, (the pixel data may be operated on by a plurality of transformation engines such as the scaling engine 100, the color conversion engine 106, and the composition engine 104. To do so, a fetch engine (not shown) fetches the data from memory and passes it to a first transformation engine). Also Homan in fig. 6 illustrates a performance between architecture with no prefetching and with prefetching (none of these are considered as a “fetch engine”. Also Pendse teaches algorithm with pre-fetching. That is different from a fetch engine that applicant claims. Homan on page 134, under section 3.1 discloses as data returns from the memory system, it is merged into the cache, i.e., meaning readdressing. Homan does not explicitly specify the claim language (e.g. transformation engine), however, Pendse on page 862, under introduction discloses a cache consists of two parts: The cache controller and cache memory. It’s obvious for any person skilled in the art to recognize the transformation engine between the cache controller and the cache memory. Examiner’s interpretation: the claim language “transformation engine” is too broad and can be applied to any type of transformation, unless Applicant provide more explicit information as what does Content Transformation Engine stand for? Definition of Content Transformation Engine is not well defined. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Pendse (i.e. teaches a S-LRU algorithm with

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pre-fetching and generating a virtual memory by dividing the cache into two segments) into Homan invention to improve the latency problem in caching and prefetching architecture. This modification would be beneficial to users working with bandwidth requirements and to incorporate caching to speed up memory accesses. Caching is implemented to improve the response time and data throughput of a computer system.

2. Claim 29.

The method of claim 28 further including: generating a virtual memory address for a second memory location. Pendse on page 863 in left column teaches a S-LRU algorithm with pre-fetching. Generating a virtual memory by dividing the cache into two segments.

3. Claim 30.

The method of claim 29 further including: re-mapping a virtual memory address of said first virtual memory location to write said transformed pixel data from said first virtual memory location to said virtual memory address of said second memory location; and transferring the pixel data to a memory controller using a memory controller client in a forward, write-through direction. The step of re-mapping is obvious because when the cache is divided into two segments, the memory addresses of first and second locations must be known in order to be able to transform the graphical data within the memory locations. Pendse on page 863 in left column teaches a S-LRU algorithm with pre-fetching. Generating a virtual memory by dividing the cache into two segments.

4. Claim 31.

The method of claim 30 further including writing pixel data to a virtual memory location associated with a memory controller client that receives pixel data written to certain virtual

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addresses. Homan in fig. 2 illustrates a texture memory system, recorder buffer and cache, which can be considered as virtual addresses.

5. Claim 32.

The method of claim 31 including causing an operating system to set aside virtual addresses for said memory controller client. See rejection of claim 26.

6. Claim 33.

The method of claim 30 wherein generating said virtual memory address for said second memory location includes transforming the addresses of said pixel data at said first virtual memory location to addresses at said second memory location. Pendse on page 863 in left column teaches a S-LRU algorithm with pre-fetching. Generating a virtual memory by dividing the cache into two segments.

7. Claim 34.

The method of claim 33 including determining the offset to pixel data by subtracting a base address at said first virtual memory location from the address of pixel data. The step is obvious. See rejection of claim 26

8. Claim 35.

The method of claim 34 including adding said offset to a base address of said second memory location. See rejection of claim 26

9. Claims 36 and 48.

The method of claim 30 wherein writing said transformed pixel data from said first virtual memory location to said second memory location includes writing the pixel data from said first virtual memory location associated with a first transfer function that performs a second

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transformation on the transformed pixel data to said second memory location associated with a second transfer function that performs a second transformation on the transformed pixel data.

The step is obvious because of the broad claim language "transfer function", it is well known in the art that a pipeline supports block moves, block reads and write operations, as well as other data transfer functions in hardware and software. Pendse on page 863 in left column teaches a S-LRU algorithm with pre-fetching. Generating a virtual memory by dividing the cache into two segments

10. Claim 37.

The method of claim 36 including transforming the addresses of the pixel data from addresses in a first virtual memory range associated with said first transfer function to memory addresses in a second virtual memory range associated with said second transfer function. Pendse on page 863 in left column teaches a S-LRU algorithm with pre-fetching. Generating a virtual memory by dividing the cache into two segments

11. Claim 38.

See rejection of claim 26. An article comprising a medium storing instructions that enable a processor-based system to: transfer pixel data to a transformation engine at a given memory address range; perform a transformation on the pixel data; and readdress the transformed pixel data to another memory address range using the transform engine and without using a fetch engine.

12. Claim 39.

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See rejection of claim 26. The article of claim 38 further storing instructions that enable the processor-based system to: manipulate the transformed pixel data without going between a memory location and another transformation engine.

13. Claim 40.

See rejection of claim 26. The article of claim 39 further storing instructions that enable the processor-based system to: write pixel data to a first virtual memory location; and perform a first pixel transformation at said first virtual memory location in a virtual memory space.

14. Claim 41.

See rejection of claim 29. The article of claim 40 further storing instructions that enable the processor-based system to: generate a virtual memory address for a second memory location.

15. Claim 42.

See rejection of claim 30. The article of claim 41 further storing instructions that enable the processor-based system to: re-map a virtual memory address of said first virtual memory location to write said transformed pixel data from said first virtual memory location to said virtual memory address of said second memory location; and transfer the pixel data to a memory controller using a memory controller client in a forward write-through direction.

16. Claim 43.

See rejection of claim 31. The article of claim 42 further storing instructions that enable the processor-based system to write pixel data to a virtual memory location associated with a memory controller client that receives pixel data written to certain virtual addresses.

17. Claim 44.

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See rejection of claim 32. The article of claim 43 further storing instructions that enable the processor-based system to cause an operating system to set aside virtual addresses for said memory controller client.

18. Claim 45.

See rejection of claim 33. The article of claim 42 further storing instructions that enable the processor-based system to transform the addresses of pixel data at said first virtual memory location to addresses at said second memory location.

19. Claim 46.

See rejection of claim 34. The article of claim 45 further storing instructions that enable the processor-based system to determine the offset to each pixel data by subtracting a base address at said first virtual memory location from the address of each pixel data.

20. Claim 47.

See rejection of claim 35. The article of claim 46 further storing instructions that enable the processor-based system to add said offset to a base address of said second memory location.

21. Claim 49.

See rejection of claim 37. The article of claim 48 further storing instructions that enable the processor-based system to transform the addresses of said pixel data from addresses in a first virtual memory range associated with said first transfer function to memory addresses in a second virtual memory range associated with said second transfer function.

22. Claim 50.

See rejection of claim 26. A system comprising: a memory controller to receive pixel data and virtual memory addresses for a transformation of the pixel data in a virtual memory space; a first

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memory controller client to forward the pixel data and virtual memory addresses to a first transfer function to perform the transformation of the pixel data; and a second memory controller client to receive data from said first transfer function together with new virtual memory addresses for transfer in a forward, write-through direction without using a fetch engine.

23. Claim 51.

See rejection of claim 26. The system of claim 50 wherein said first memory controller client is to selectively forward the pixel data and virtual memory addresses to one of a plurality of transfer functions and said second memory controller client is to receive the pixel data with new virtual memory addresses from said plurality of transfer functions.

24. Claim 52.

See rejection of claim 31. The system of claim 51 wherein said second memory controller client is to write the pixel data back to said memory controller.

25. Claim 53.

See rejection of claim 26. The system of claim 50 including a plurality of transfer functions to perform transformation on the pixel data, one of said transfer functions arranged to write output data to an address range of another of said transfer functions.

26. Claim 54.

See rejection of claim 37. The system of claim 53 wherein said transfer functions are associated with virtual memory address ranges.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A. Amini whose telephone number is (571) 272-7654. The examiner can normally be reached on 8-4

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi, can be reached at (571) 272-7664. The fax phone Number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Javid A Amini
Examiner
Art Unit 2672

Javid Amini

Jeffrey G. Brier
JENNIFER G. BRIER
PRINCIPAL EXAMINER